

the Examiner in the second Office Action; (3) the subject matter of the amendment already has been included in the Examiner's search and therefore does not require the Examiner to perform further searching; (4) the amendment places the application in condition for allowance or in better condition for appeal; and (5) the amendment does not result in a net addition of claims to the application. Consequently, Applicants respectfully request that the Amendment After Final Rejection be entered in accordance with 37 C.F.R. §116 and MPEP 714.13.

In The Specification

The Examiner has objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. More specifically, the Examiner asserts that the term "rotation surface" as used in amended claim 1 has not been discussed or defined in the specification. In view of the foregoing amendment, Applicants respectfully traverse this objection.

Applicants have amended the specification to disclose, in pertinent part, the following:

The sheave 27 has a rotation surface 27b (Fig. 2(a)), generally perpendicular to an axis of rotation of the sheave 27 and opposed to a side of the ascending and descending cage 52 when the ascending and descending cage 52 is positioned at the top floor 57.

The specification has been amended to secure substantial correspondence between the term "rotation surface" recited in claim 1, shown as a structural feature of the sheave 27 in original Figs. 1-2 and denoted by the addition of the reference characters 27b and the associated lead line in the proposed drawing amendment discussed below. No new matter has been added.

Applicants respectfully submit that the specification as amended provides proper antecedent basis for the claimed subject matter and request that the objection to the specification be withdrawn.

Claim Rejections - 35 U.S.C. § 112

The Examiner has rejected claims 1-6 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which

the Applicants regard as the invention. Specifically, the Examiner argues that it is unclear in claim 1 as to what surface would be considered as the “rotation” surface of the sheave. Applicants respectfully traverse this rejection in view of the foregoing amendment.

Applicants have amended claim 1 to recite, *inter alia*,

... a rotation surface of aid sheave is generally perpendicular to an axis of rotation of said sheave and opposed to a side of said cage when said cage is positioned at said top floor.

Support for this amendment can be found in Figs. 1-2 wherein the “rotation surface” is shown as a structural feature of the sheave 27 and is denoted by the addition of the reference characters 27b and associated lead line proposed in the foregoing drawing amendment. Applicants have amended claim 1 to more particularly point out and claim the rotation surface of the sheave 27 and the spacial orientation of the rotational surface.

It is respectfully submitted that independent claim 1 and dependent claims 2-6 are in full compliance with 35 U.S.C. § 112, second paragraph. Accordingly, Applicants request that the rejection of claims 1-6 be withdrawn.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent No. JP 8-169671 (Yoshifumi). The Examiner contends that the term “adjacent” in claim 1 is broad so as to read upon the relationship between the elevator cage and the drive sheave of Yoshifumi. Applicants respectfully traverse this rejection in view of the foregoing amendment.

Applicants have amended claim 1 to recite, *inter alia*,

a rotation surface of said sheave is [adjacent] generally perpendicular to an axis of rotation of said sheave and opposed to a side of said cage when said cage is positioned at said top floor.

Support for the amendment can be found in original Figs. 1 and 2a in which the rotational surface is shown as a structural feature of the sheave 27 and is denoted by the addition of the reference characters 27b and the associated lead line proposed in the foregoing drawing

amendment. Further support for the amendment can be found on page 8 in the second full paragraph of the specification, which provides, *inter alia*,

There is provided a machine room 58 on the top floor 57 of the building 50 facing with the elevator passage 59. The actuating device 1 is arranged in the machine room 58 in such a manner that the outer periphery of the sheave 27 is positioned above the rope 29 in a vertical direction.

Still further support for the amendment can be found on page 11 in the first full paragraph of the specification as amended, which provides, *inter alia*,

According to the embodiment of the invention, as shown in Fig. 2(b), the ascending and descending cage 52 which has arrived at the top floor 57 (shown by an alternate long and short dash line) and the sheave 27 are laterally separated from each other.

Applicants amended claim 1 to clarify the orientation of the sheave and the rotation surface of the sheave in relation to the elevator cage when the cage is at the top floor.

Yoshifumi does not disclose each and every limitation of amended claim 1.

Yoshifumi does not disclose a sheave with a rotation surface that opposes a side of an elevator cage when the cage is at a top floor of a building. Yoshifumi discloses a sheave 13 within a machine room 20 that communicates with a cage 22 and a counterweight 23 within the elevator shaft 21 using warp sheaves 3 supported by warp sheave beams 2A, 2B to allow a rope 6 to enter the elevator shaft 21 from the machine room 20 through the top of the elevator shaft 21. Using this orientation, the rotation surface of the sheave 13 faces in a direction generally perpendicular to the cage 22 when the cage 22 is at a top floor. Accordingly, Yoshifumi does not disclose each and every element of claim 1. Therefore, Applicants respectfully submit that claim 1 is not anticipated by Yoshifumi and request that the rejection of claim 1 be withdrawn.

The Examiner further rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by U.K. Patent App. No. 2 201 657 A (Beaulieu). The Examiner contends that Beaulieu discloses an actuating device including a sheave (20) around which a rope [22] engaged with an ascending and descending cage (10) is wound, the sheave being adapted to rotate thereby to move the rope with its rotation, a driving section (18) for rotating said sheave, wherein the actuating device is installed in a machine room provided on a top floor of a building in which the

ascending and descending cage is disposed, and the machine room is adjacent an elevator passage for the cage, and a rotation surface of the sheave is adjacent a side of the cage when the cage is positioned at the top floor. Applicants respectfully traverse this rejection in view of the foregoing amendment.

Applicants have amended claim 1 to recite as a limitation therein the speed-reducer formerly recited in original claim 2 depending from claim 1. Amended claim 1 now recites, *inter alia*,

an actuating device including a sheave . . . and a driving section for rotating said sheave, said driving section including a speed-reducer.

Claim 2 has been correspondingly amended to recite, *inter alia*, "the speed-reducer mounted on a first side of said support member."

Beaulieu does not disclose each and every limitation of amended claim 1. Beaulieu does not disclose a driving section including a speed-reducer. Instead, Beaulieu discloses an elevator car 10 that is connected to a drive motor 18 which rotates a drive sheave 20. Beaulieu does not teach a speed-reducer associated with the drive motor 18. Accordingly, Beaulieu does not disclose each and every element of claim 1. Therefore, Applicants respectfully submit that claim 1 is not anticipated by Beaulieu and request that the rejection of claim 1 be withdrawn.

The Examiner has rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by European Patent App. No. EP 0 719 724 A1 (Aulanko). Referring to Fig. 4, the Examiner contends that Aulanko discloses an actuating device including a sheave (107) around which a rope (103) engaged with an ascending and descending cage (101) is wound, the sheave being adapted to rotate thereby to move the rope with its rotation, a driving section (106) for rotating said sheave, wherein the actuating device (106) is installed in a machine room (109) provided on a top floor of a building in which the ascending and descending cage is disposed, and the machine room is adjacent an elevator passage for the cage, and a rotation surface of the sheave is adjacent a side of the cage when the cage is positioned at the top floor. Applicants respectfully traverse this rejection.

Aulanko discloses an elevator car 1 suspended on a set of hoisting ropes 3 in an elevator shaft 17. A drive machine unit 6 drives a traction sheave 7 to move the set of hoisting ropes 3, thereby moving the elevator car 1, offset by a counterweight 2, upwardly and downwardly within the elevator shaft 17. The drive machine unit 6 is placed in a machine space 9 within the elevator shaft 17. The machine space 9 and drive machine unit 6 may be placed at either the top or the bottom of the elevator shaft 17.

Aulanko does not disclose each and every element of the present invention.

Claim 1 as amended recites, *inter alia*,

... said machine room is adjacent an elevator passage for said cage and a rotation surface of said sheave is generally perpendicular to an axis of rotation of said sheave and opposed to a side of said cage when said cage is positioned at said top floor.

Aulanko does not disclose a machine room adjacent an elevator passage wherein a sheave is located such that a rotation surface of the sheave faces a side of a cage when the cage is positioned at a top floor. Instead, Aulanko discloses a machine space 9 within an elevator shaft 17 wherein the machine space 9 can be located either at the top or the bottom of the elevator shaft 17. Accordingly, Aulanko does not disclose each and every element of claim 1. Therefore, Applicants respectfully submit that claim 1 is not anticipated by Aulanko and request that the rejection of claim 1 be withdrawn.

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected claims 1-3, 5, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent No. 2-70689 (Heikkinen) in view of Beaulieu or Yoshifumi. The Examiner contends that Heikkinen shows the basic claimed elevator actuating device including a support member (the left portion of the mounting bracket which is indicated as 7 in Fig. 1), a speed-reducer (2,5) mounted on a first side of the support member, and a drive assembly (6) with a brake mounted on a second side of the support member. The Examiner admits that the claims do not specify that the drive assembly is a motor. The Examiner contends that Heikkinen additionally varies from claims 1-3, 5, and 6 by not specifying that the drive motor is mounted in a machine room at the top floor of the building. The Examiner contends that Beaulieu and Yoshifumi show similar sheave elevator arrangements with their actuating

devices located in machine rooms adjacent to the top floor of the building, and that it would have been obvious to one having ordinary skill in the art to locate the elevator drive of Heikkinen in a machine room at the top of the building, as to have it off to the side of the elevator shaft reducing the hoistway height, as suggested by Beaulieu or Yoshifumi. Applicants respectfully traverse this rejection.

Amended claim 1 is directed to an actuating device for an elevator apparatus and recites, *inter alia*,

... an actuating device including a sheave . . . , a driving section for rotating said sheave, said driving section including a speed-reducer,

wherein said actuating device is installed in a machine room provided on a top floor of a building in which said ascending and descending cage is disposed, said machine room is adjacent an elevator passage for said cage and a rotation surface of said sheave is generally perpendicular to an axis of rotation of said sheave and opposed to a side of said cage when said cage is positioned at said top floor.

Heikkinen does not disclose each and every element of the present invention and is an entirely different structure from the present invention. Heikkinen discloses a traction sheave 3 supported by a frame plate 7. A brake 6 is situated on one side of the sheave 3 with a motor 1 on the other side. Mounted within the traction sheave 3 is an intermediate gear 5 between the inner surface of a pulley rim and a drive shaft 2. The motor 1 rotates the drive shaft 2, which, in turn, rotates the intermediate gear 5, thereby rotating the traction sheave 3. The traction sheave 3 moves a rope 4 connected to an elevator car 9 in order to raise and lower the elevator car 9. The Examiner admits that Heikkinen does not specify that the drive motor be mounted in a machine room at the top floor of the building. The claimed invention is further distinguishable over Heikkinen in that the rotation surface of the traction sheave 3 disclosed in Heikkinen cannot be "opposed to a side of said cage when said cage is positioned at said top floor" as recited in claim 1 because the brake 6 is an intervening structure. Consequently, Heikkinen does not disclose an elevator machine having a rotation surface of a sheave that is opposed to a side of a cage when the cage is positioned at a top floor. Accordingly, there is no objective teaching in Heikkinen that would enable one of ordinary skill in the art to modify the

elevator machine in a manner that would render the present invention obvious under 35 U.S.C. § 103(a).

Beaulieu, as described above, does not disclose each and every element of the present invention and is an entirely different structure from the present invention. Beaulieu does not disclose an actuating device with a drive section including a speed-reducer. Further, there is no objective teaching in Beaulieu that would enable one of ordinary skill in the art to modify the drive motor of Beaulieu in a manner that would render the present invention obvious under 35 U.S.C. § 103(a).

Heikkinen and Beaulieu are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious. It is well settled that when making a rejection under 35 U.S.C. § 103(a), the Examiner has the burden of establishing a *prima facie* case of obviousness. The Examiner can satisfy this burden only by showing an objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the teachings of the references in the manner suggested by the Examiner. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching, suggestion or incentive supporting the combination. *In re Geiger*, 2 U.S.P.Q.2d 1276, 1278 (Fed. Cir. 1987). Prior art references taken in combination do not make an invention obvious unless something in the particular prior art references would suggest the advantages to be derived from combining the teachings of the references. *In re Sernaker*, 217 U.S.P.Q. 1, 6 (Fed. Cir. 1983). The mere fact that the prior art could be modified in the manner proposed by the Examiner does not make the modification obvious unless the prior art suggests the desirability of the modification. *Ex parte Dussaud*, 7 U.S.P.Q.2d 1818, 1820 (PTO Bd.P.App.&Int. 1988). As the Court of Appeals for the Federal Circuit points out, it is impermissible to use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *Fine*, 5 U.S.P.Q.2d at 1600. “Something in the prior art *as a whole* must suggest the desirability, and thus the obviousness of [the invention].” *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 5 U.S.P.Q.2d 1434, 1438 (Fed. Cir. 1988) (emphasis added). See M.P.E.P. § 2143. It is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness with respect to claim 1.

There is no objective teaching in Heikkinen or Beaulieu, nor is there knowledge generally available to one of ordinary skill in the art, that would lead the artisan to place the elevator machine taught by Heikkinen in a machine room adjacent to the top floor of a building as taught by Beaulieu. Accordingly, the Heikkinen and Beaulieu references are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious.

Even if Heikkinen and Beaulieu were combined, the combination does not render the present invention obvious. The Examiner has admitted that Heikkinen does not disclose an actuating device located in a machine room adjacent to the top floor of the building. Since Heikkinen does not disclose a rotation surface of a sheave opposed to a side of a cage when the cage is positioned at a top floor, combining Heikkinen with the teaching of Beaulieu, namely positioning the actuating device in a machine room adjacent to the top floor of a building, fails to disclose the subject limitation. As the combination of Heikkinen and Beaulieu does not teach or suggest all of the elements of claim 1 of the Applicants' invention, it is respectfully submitted that claim 1 and claims 2, 3, 5, and 6 depending therefrom are patentably distinct from Heikkinen in view of Beaulieu.

Yoshifumi, as described above, does not disclose each and every element of the present invention and is an entirely different structure from the present invention. Yoshifumi does not disclose a rotation surface of a sheave that is generally perpendicular to an axis of rotation of the sheave and opposed to a side of a cage when the cage is positioned at a top floor. Further, there is no objective teaching in Yoshifumi that would enable one of ordinary skill in the art to modify the orientation and location of the sheave 13 taught in Yoshifumi in a manner that would render the present invention obvious under 35 U.S.C. § 103(a).

Heikkinen and Yoshifumi are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious. There is no objective teaching in Heikkinen or Yoshifumi, nor is there knowledge generally available to one of ordinary skill in the art, that would lead an artisan to combine the location of the actuating device in the machine room adjacent to the top floor of Yoshifumi with the elevator drive apparatus of Heikkinen. Accordingly, the Heikkinen and Yoshifumi references are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious.

Even if Heikkinen and Yoshifumi were combined, the combination does not render the present invention obvious. More specifically, since neither Heikkinen nor Yoshifumi discloses a rotation surface of a sheave generally perpendicular to an axis of rotation of the sheave and opposed to a side of a cage when the cage is positioned at a top floor, the combination of Heikkinen and Yoshifumi fails to disclose the subject limitation. Accordingly, claim 1 and claims 2, 3, 5, and 6 depending therefrom are patentably distinct from Heikkinen in view of Yoshifumi.

For the above reasons, Applicants respectfully requests that the rejection of claims 1-3, 5, and 6 under 35 U.S.C. § 103(a) be withdrawn.

The Examiner has rejected claims 2-6 under 35 U.S.C. § 103(a) as being unpatentable over Heikkinen in view of Beaulieu or Yoshifumi, as applied to claim 1, and further in view of U.S. Patent No. 5,469,937 (*Hakala et al.*). The Examiner admits that Heikkinen in view of Beaulieu or Yoshifumi varies from claims 2 and 4 by not having the brake located radially inwardly of the motor. The Examiner contends that *Hakala et al.* shows a similar compact elevator drive and teaches placing the brake mechanism within the motor. The Examiner further contends that it would have been obvious to one having ordinary skill in the art to modify the actuating assembly of Heikkinen as modified by either Beaulieu or Yoshifumi by having the brake mechanism located radially within the motor, as taught by *Hakala et al.* Applicants respectfully traverse this rejection.

Hakala et al. does not disclose each and every element of the present invention and is an entirely different structure from the present invention. *Hakala et al.* discloses a drive machine unit 6 of an elevator placed below the path of a counterweight 2. The drive machine unit 6 has an elevator motor 106 mounted on an axle 113, which is fixed to opposite points on two side plates 111, 112. The elevator motor 106 has a rotor 117 with rotor winding 120 placed on the inner surface of the rotor 117 and a stator 114 with stator winding 115 connected to the side plate 111. Between the stator 114 and the rotor 117 is a brake 121. The traction sheave 7 is formed by the outer cylindrical surface of the rotor 117. The side plates 111, 112 together with connecting pieces 125 form a box-like structure around the drive machine unit 6. *Hakala et al.* does not disclose a rotation surface of a sheave that is generally perpendicular to an axis of

rotation of the sheave and opposed to a side of a cage when the cage is positioned at a top floor. Further, there is no objective teaching in Hakala *et al.* that would enable one of ordinary skill in the art to modify the orientation and location of the sheave 13 taught in Hakala *et al.* in a manner that would render the present invention obvious under 35 U.S.C. § 103(a).

Hakala *et al.* is not properly combinable with Heikkinen modified in view of Beaulieu or Yoshifumi to render the present invention obvious. There is no objective teaching in Heikkinen, Beaulieu, Yoshifumi, or Hakala *et al.*, nor is there knowledge generally available to one of ordinary skill in the art, that would lead an artisan to combine the brake mechanism of Hakala *et al.* with the modified Heikkinen. Accordingly, the Heikkinen, Beaulieu or Yoshifumi, and Hakala *et al* references are not properly combinable under 35 U.S.C. § 103(a) to render the present invention obvious.

Even if the modified Heikkinen were further modified by the teachings of Hakala *et al.*, the combination does not render the present invention obvious. More specifically, the box-like structure formed by the side plates 111, 112 and the connecting pieces 125 discussed above is an essential feature of the brake mechanism within motor teaching of Hakala *et al.* Similarly, the traction sheave 7 being integral with the rotor 117 also is an essential feature of the Hakala *et al.* device. Consequently, the modified Heikkinen further modified by the teachings of Hakala *et al.* would have the traction sheave 7 within the box-like structure and the combination would not teach a rotation surface of a sheave generally perpendicular to an axis of rotation of the sheave and opposed to a side of a cage when the cage is positioned at a top floor because one of the side plates 111, 112 is an intervening structure. Therefore, claims 2-6 are patentably distinct from the modified Heikkinen further modified by the teachings of Hakala *et al.* Accordingly, Applicants respectfully request that the rejection of claims 2-6 be withdrawn.

Drawings

Filed concurrently herewith is a Submission of Proposed Drawing Amendment for Approval by Examiner (35 C.F.R. §1.123) in which Applicants propose that Figs. 1-2 be amended to identify by the addition of the reference characters 27b and the associated lead line the “rotation surface” of the sheave 27 recited in claim 1 as amended and disclosed in the specification as amended. Figs. 1-2 have been marked in red to show the addition. Applicants

respectfully submit that the amendment to Figs. 1-2 does not introduce new matter as the originally filed drawings show the rotation surface of the sheave 27.

Applicants respectfully request that the proposed drawing change be approved. Upon approval of the proposed drawing change and allowance of the application, Applicants will file formal drawings incorporating the proposed change in accordance with United States Patent and Trademark Office procedures.

CONCLUSION

In view of the foregoing Amendment and Remarks, as well as the proposed Drawing Amendment, Applicants respectfully submit that the present application, including claims 1-6 is in condition for allowance. Entry of the Amendment, withdrawal of the Final Rejection and Notice of Allowability of claims 1-6 is respectfully requested. Should the Examiner choose to issue an Advisory Action, Applicants respectfully request that prior thereto, the Examiner telephone the undersigned at the telephone number indicated to discuss the application.

Respectfully submitted,

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(Date)

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Marked-Up Version Of Amended Specification Paragraph

Page 11, lines 6-20:

According to the embodiment of the invention, as shown in Fig. 2(b), the ascending and descending cage 52 which has arrived at the top floor 57 (shown by an alternate long and short dash line) and the sheave 27 are laterally separated from each other[.]. The sheave 27 has a rotation surface 27b (Fig. 2(a)), generally perpendicular to an axis of rotation of the sheave 27 and opposed to a side of the ascending and descending cage 52 when the ascending and descending cage 52 is positioned at the top floor 57. The [the] ascending and descending cage 52 can approach to the ceiling 57d leaving the least allowable space for the overrun. Therefore, there is no need of providing the rope pulleys, the deflecting sheaves or the like in the upper part of the elevator passage 59, and so, the structure will be simplified and the overall height of the building 50 will not be unnecessarily increased. The allowable space for the overrun means a space formed between the ceiling 57d and an upper face of the ascending and descending cage 52 at its ordinary stopping position, in order to avoid a collision of the ascending and descending cage 52 with the ceiling 57d when it has overrun upward.

Marked-Up Version of Amended Claims

1. (Twice Amended) An elevator apparatus comprising:
an actuating device including a sheave around which a rope engaged with an ascending and descending cage is wound, said sheave being adapted to rotate thereby to move said rope with its rotation, and a driving section for rotating said sheave, said drive section including a speed-reducer,

wherein said actuating device is installed in a machine room provided on a top floor of a building in which said ascending and descending cage is disposed, said machine room is adjacent an elevator passage for said cage and a rotation surface of said sheave is [adjacent] generally perpendicular to an axis of rotation of said sheave and opposed to a side of said cage when said cage is positioned at said top floor.

2. (Twice Amended) The elevator apparatus according to claim 1, wherein said actuating device includes a support member, [a] the speed-reducer mounted on a first side of said support member, a drive assembly mounted on a second side of said support member, and a brake assembly supported on said second side of said support member, said second side being opposite from said first side.